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Study of single-muon and J/Ψ production in pp collisions at $\sqrt{s} = 2.76$ TeV as a function of multiplicity with ALICE

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The high energy density reached in pp collisions at LHC could be comparable with the energy density for heavy-ion collisions at lower energies (i.e. Au-Au collisions at RHIC) and it might lead to the observation of collective phenomena. The multiplicity of the collision can be used as the “centrality” variable in pp collisions at LHC.

In particular, the LHC provided p-p collisions at $\sqrt{s} = 2.76$ TeV, the same energy per nucleon-nucleon collisions studied in Pb-Pb. These data were already used as a reference to measure the nuclear modification factor (RAA) of J/Ψ production in Pb-Pb collisions.

One can search for possible collective effects in pp collisions by studying the multiplicity dependence of various observables commonly studied as probes of the Quark Gluon Plasma in heavy-ion collisions. In particular, this study will present results on the production of single-muon and J/Ψ at forward rapidity as a function of the charged particle density measured at mid-rapidity in pp collisions at 2.76 TeV with the ALICE detector.

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